



CALIFORNIA HIGH SPEED RAIL AUTHORITY

Draft Program EIR/EIS

**Revised Staff Recommendations on
Identifying Preferred Alignment and
Station Locations – Part 2**



REVISED STAFF RECOMMENDATIONS: Preferred HST Alignment and Station Locations (Part 2)

Introduction

In the Summary of the Draft Program EIR/EIS, the Authority and the Federal Railroad Administration (FRA) conclude that the High-Speed Train (HST) alternative is the preferred system alternative, but do not identify a preference among the HST alignment and station options presented. The Summary also states (Next Steps in the Environmental Process) that as part of the Final Program EIR/EIS, the Authority may identify one or more potential HST alignment options as preferred for the proposed high-speed train (HST) system and may also identify preferred station locations within an identified preferred corridor for the proposed HST system. In order to facilitate the selection of preferred alignment and station locations for the HST alternative in the Final Program EIR/EIS, the Authority staff presented recommendations to the Authority at the last two board meetings. Part 1 was presented at the September 22, 2004 board meeting in Los Angeles, and Part 2 was presented at the November 10, 2004 board meeting. Based upon input from the Board and the public, staff has made minor revisions to the document (highlighted). These revised recommendations are being presented as "Action" items to the board. The Authority may act to approve some or all of these recommendations on December 15, 2004, or it may defer action to a later board meeting.

Part 1 covered the following segments: San Jose to Merced (Northern Mountain Crossing); Bakersfield to Sylmar (Southern Mountain Crossing); Sylmar to Los Angeles; and Los Angeles to Orange County. Part 2 covers the remaining segments which include the following segments: Sacramento to Bakersfield; San Francisco to San Jose; Oakland to San Jose; and Los Angeles to San Diego via the Inland Empire. Aside from the introduction, this document pertains only to the Part 2 recommendations.

Staff recommendations are based upon the data presented in the Draft Program EIR/EIS and supporting technical reports, and the comments received on the Draft Program EIR/EIS (the comment period concluded on August 31, 2004). Chapter 6 of the Draft Program EIR/EIS summarizes and compares the physical and operational characteristics and potential environmental consequences associated with the HST alignment and station options where relative differences were identified including:

- Physical/operational characteristics
 - Alignment
 - Length
 - Capital Cost
 - Travel Time
 - Ridership
 - Constructability
 - Operational Issues
- Potential environmental impacts
 - Transportation related topics (air quality, noise and vibration, and energy)
 - Human environment (land use and community impacts, farmlands and agriculture, aesthetics and visual resources, socioeconomics, utilities and public services, hazardous materials and wastes)
 - Cultural resources (archaeological resources, historical properties) and paleontological resources
 - Natural environment (geology and seismic hazards, hydrology and water resources, and biological resources and wetlands).
 - Section 4(f) and 6(f) resources (certain types of publicly owned parklands, recreation areas, wildlife/waterfowl refuges, and historical sites).

In making these recommendations for identifying preferred alignments and station locations the staff was guided by the objectives and criteria that were adopted by the Authority and were applied in the screening evaluation as documented in Section 2.6.9 of the Draft Program EIR/EIS (see Table 2.6.5 below).

**Table 2.6-5
High-Speed Rail Alignment and Station Evaluation Objectives and Criteria**

Objective	Criteria
Maximize ridership/revenue potential	Travel time Length Population/employment catchment area
Maximize connectivity and accessibility	Intermodal connections
Minimize operating and capital costs	Length Operational issues Construction issues Capital cost Right-of-way issues/cost
Maximize compatibility with existing and planned development	Land use compatibility and conflicts Visual quality impacts
Minimize impacts on natural resources	Water resources impacts Floodplain impacts Wetland impacts Threatened and endangered species impacts
Minimize impacts on social and economic resources	Environmental justice impacts (demographics) Farmland impacts
Minimize impacts on cultural and parks/wildlife refuge resources	Cultural resources impacts Parks and recreation impacts Wildlife refuge impacts
Maximize avoidance of areas with geologic and soils constraints	Soils/slope constraints Seismic constraints
Maximize avoidance of areas with potential hazardous materials	Hazardous materials/waste constraints

Several factors were considered in identifying potential station stops, including speed, cost, local access times, potential connections with other modes of transportation, ridership potential, and the distribution of population and major destinations along the route. There is a critical tradeoff between the accessibility of the system to potential passengers, which is provided by multiple stations and stops, and the resulting HST travel times. Additional or more closely spaced stations (even with limited service) would lengthen travel times, reduce frequency of service, and the ability to operate both express and local services. The ultimate location and the configuration of stations cannot be determined at this time; this would occur during subsequent project-level environmental processes. Recommendations are made on station options to allow the Authority to pursue proposed station development at or near that location in future studies. It is possible and likely that some of the station locations identified as preferred in the Final Program EIR/EIS will not be built.

The station sites recommended as preferred locations are all multi-modal transportation hubs that would provide links with local and regional transit, airports and highways. It is assumed that parking at the stations would be provided at market rates (no free parking). Each station site would have the potential to promote higher density, mixed-use, pedestrian oriented development around the station. As the project proceeds to more detailed study, local government would be expected to provide (through planning and zoning) for transit-oriented development around HST station locations, and to finance (e.g., through value capture or other financing techniques) and to maintain the public spaces needed to support the pedestrian traffic generated by hub stations if they are to have a HST station.

All the headings below indicate staff's recommendations of preferred alignments and station locations for the Authority's consideration. References to existing rail right-of-way as preferred alignments mean the proposed HST system would be located generally within or adjacent to the existing rail right-of-way, unless otherwise specified (e.g., shared use). "Constructability" issues refer to substantial engineering and construction complexity as well as excessive initial and/or recurring costs that present logistical constraints. "Connectivity" relates to how well a station site links with other modes of transportation (transit systems, aviation, and/or highways) and "accessibility" relates to how well the station site is located for serving the surrounding population. "Compatibility" relates to how well a station site fits within current or planned local land uses as defined in local plans.

Sacramento - Bakersfield

The region from Sacramento to Bakersfield was divided into four segments for analysis: 1) Sacramento to Stockton; 2) Stockton to Merced; 3) Merced to Fresno; and 4) Fresno to Bakersfield.

The alignments considered in the Sacramento – Bakersfield corridor generally followed the two existing freight corridors of the UP and the BNSF. With that in mind, HST impacts throughout the Central Valley that have already been reduced and avoided could be further avoided and minimized by sharing the existing freight railroad right-of-way. If a decision were made to proceed with the HST system, the Authority should seek agreements with freight operators to utilize portions of the existing rail right-of-way to the greatest feasible extent.

In studying the two freight corridors between Stockton and Bakersfield both offer similar travel times and provide access to the Central Valley population centers, however it has become apparent that the BNSF alignment is more compatible with HST service and operations. Throughout the corridor the UP alignment passes through more urban areas and would require more aerial structures, thereby increasing adverse impacts to communities. Both the UP and BNSF have freight activity; however, the UP serves more local industries adjacent to the corridor that the HST alignment would have to avoid. This would typically be accomplished by using aerial structures to fly over the local freight tracks, which would add cost and cause additional adverse community impacts. The BNSF alignment traverses a more rural setting, would require fewer aerial structures and would cause fewer impacts to Central Valley communities.

A great advantage of the BNSF alignment is that much of the HST system could be constructed at grade such that the freight track would be grade separated along with the adjacent HST tracks. This would benefit freight services and communities by reducing noise (due to the elimination of horn noise and gate noise from existing services), providing improved safety, freeing automobile traffic and improving air quality through reduced congestion.

The Authority staff, in consultation with the FRA, has identified a broad corridor between the Bay Area and the Central Valley containing a number of feasible route options within which further study will permit the identification of a single preferred alignment alternative. This corridor is bounded generally by (and includes) the Pacheco Pass (SR-152) to the south, the Altamont Pass (I-580) to the north, the BNSF Corridor to the east, and the Caltrain Corridor to the west, but would not include alignment options through Henry Coe State Park and station options at Los Banos.¹ The Authority staff recommends that future studies focus on the identification of a preferred alignment between the Central Valley and the San Francisco Bay area.

Future studies should include consideration of: (1) how and where the HST alignment from the Bay Area would connect with the HST alignment in the Central Valley; (2) how and where the HST alignment would enter the Bay area and would connect to Bay Area termini; (3) the location of stations within these segments.

The recommendations herein for portions of the Sacramento to Bakersfield alignment and stations which are also in the broad corridor identified for further study between the Central Valley and the Bay Area (see above) are based upon current information. These recommendations are subject to change based upon the information provided in other future studies.

¹ Highway route numbers are provided only as a convenient reference for the reader, not as a limitation on the corridor to be considered.

Sacramento to Stockton

Preferred Alignment:

- Union Pacific Railroad (UPRR)

Analysis:

The UPRR alignment begins at the Sacramento Rail Depot in downtown Sacramento. North of Lodi, the alignment diverges from UPRR to CCT to bypass Lodi and reconnects to the UPRR to serve the proposed downtown Stockton station site. This alignment option includes a new alignment bypass of Stockton for express services (see Figure 6.3-1). Using the existing freight corridor through most of this segment would minimize and avoid environmental impacts. The UPRR is a more direct route with slightly shorter travel times (1 minute less) and lower construction costs (an estimated \$150 million less) than the CCT alignment option. The CCT is a recently abandoned freight corridor, so there is less ambient noise in this corridor than the UPRR. In addition, the CCT has more adjacent land designated for residential and agricultural use than the UPRR alignment. The UPRR is a heavily used freight rail corridor and the grade separation improvements along this alignment would result in potential reductions in noise levels from existing conditions due to the elimination of horn noise and gate noise from existing services. The Authority staff recommends identifying the UPRR alignment option as preferred between Sacramento and Stockton.

While the Sacramento region is supportive of a statewide HST system serving Sacramento, there is substantial community opposition to placing the HST on the CCT alignment. Both the Sacramento Area Council of Governments (SACOG) and the City of Elk Grove (which is bisected by both alignments) support HST on the UPRR and oppose the use of the CCT alignment as a result of potential community impacts. The California Department of Parks and Recreation has expressed concern over both the UPRR and CCT alignments, stating both options potentially impact the Stone Lakes National Wildlife Refuge in Southern Sacramento County. Parks and Recreation prefers the CCT alignment, citing of the two alignment options the CCT alignment could have potentially fewer impacts on the wildlife and recreation areas of Stone Lakes Refuge. The Authority staff recommends comprehensive study to avoid and/or minimize the potential impacts to these sensitive areas as part of project level environmental review. Although SACOG supports the UPRR alignment through Elk Grove they have expressed concern regarding the UPRR alignment bisecting the City of Galt, which is the southernmost community in Sacramento County.

Preferred Station Locations:

- Sacramento: Downtown Sacramento

Analysis:

The Authority staff recommends identifying the Downtown Sacramento station as the preferred HST station option to serve the Sacramento metropolitan area (see Figure 6.3-5A). This station option would maximize opportunities for intermodal connectivity and is located in downtown Sacramento within walking distance of the State Capitol. This multimodal hub station location serves the existing Amtrak services to Sacramento, including the Capitol Corridor, and the Sacramento LRT, which is being extended to directly link with this station site. The HST platforms could be constructed on an aerial structure above the platforms for the existing rail services. The Downtown Sacramento station option is preferred by the City of Sacramento, and SACOG.

- Stockton: Stockton Downtown ACE

Analysis:

The Authority staff recommends identifying the Stockton Downtown ACE station option as the preferred HST station option to serve the Stockton area, and San Joaquin County (see Figure 6.3-5B). The Stockton Downtown ACE option would maximize connectivity with good freeway access and bus transit service, and would share the site with ACE commuter rail and present Amtrak services. Comments received by the Department of Transportation (Caltrans) recommend a potential HST station be considered for the BNSF rail alignment to the east of Stockton. In discussions with Caltrans they have indicated they are working on relocating the Stockton Amtrak station to a location along the BNSF alignment to the east of Stockton. It is recommended that a potential station along the BNSF alignment be considered at the project-specific level.

Stockton to Merced

The Authority staff, in consultation with the FRA, has identified a broad corridor between the Central Valley and the Bay Area containing a number of route options within which further study will permit the identification of a single preferred alignment alternative. The recommendations herein for the portion of the Stockton to Merced alignment and stations, which are also within the broad corridor identified for further study between the Central Valley and the Bay Area and are based upon current information. These recommendations are subject to change based upon the information provided in other future studies.

Preferred Alignment:

- Burlington Northern Santa Fe (BNSF)

Analysis:

The Authority staff recommends identifying the BNSF alignment as the preferred alignment option for HST service between Stockton and Merced (see Figure 6.3-2A).

The BNSF alignment avoids most of the urban areas between Stockton and Merced and therefore would have less constructability issues, less property impacts, and cost less than the UPRR alignment. The BNSF alignment is estimated to be about \$400 million less costly than the UPRR alignment since it would include less urban area construction, would be mostly at grade (the UPRR alignment option includes aerial structures through Modesto and Turlock), and would not include an express loop around Modesto.

The BNSF alignment also would have fewer potential environmental impacts, and would serve the Castle Air Force Base station option serving Merced. Since the BNSF alignment minimizes urban area construction, it would have less potential for noise impacts than the UPRR option. Moreover, while the BNSF alignment would follow existing rail-right-of-way and minimize the potential for environmental impacts, the UPRR alignment would include a new express loop through agricultural land around Modesto because of speed restricting curves through downtown Modesto, which would have considerable potential for severance impacts and direct impacts to agricultural lands (about 97 ac (39 ha)). The USEPA has expressed concern over the additional impacts caused by bypasses to farmlands, noise and visual, water and biological resources.

Impacts throughout this segment could be avoided and minimized by sharing the existing freight railroad right-of-way. If a decision were made to proceed with the HST system, the Authority staff would seek agreements with BNSF to utilize the existing rail right-of-way to the greatest extent feasible.

Preferred Station Locations:

- Modesto: Amtrak Briggsmore

Analysis:

The Authority staff recommends identifying the Amtrak Briggsmore option as the preferred HST station location to serve Stanislaus County (see Figure 6.3-2B). This is a multi-modal hub station and is the site of a new Amtrak station with a direct connection to Amtrak services and bus services. This is the only station option investigated in Stanislaus County along the BNSF alignment, which is also recommended as the preferred HST alignment option.

- Merced: One station only – either Castle Air Force Base (BNSF using UP alignment through downtown Merced) or Downtown Merced

Analysis:

The Authority staff recommends continuing to investigate both the Castle Air Force Base (AFB) and the Downtown Merced station options to serve Merced County. The Castle (AFB) site is about 7 miles (11 km) northwest from downtown Merced, but would provide the best access to the developing UC Merced campus via a new highway alignment along Bellevue Avenue. This option would require an additional two-track alignment loop line be constructed to serve Castle AFB station site. While this option would have less connectivity and accessibility to downtown Merced, it would have fewer construction impacts (since only two tracks would be required through downtown Merced). USEPA has expressed concern over loop concepts in the Central Valley, noting that the additional tracks would increase potential environmental impacts; therefore, it is recommended that a potential station along the BNSF alignment be considered at the project-specific level. The Castle AFB option is supported by the City and County of Merced, UC Merced, and the Merced High-Speed Rail Committee. Comments were also received from federal and state elected officials as well as local governments and organizations in support of a maintenance hub at Castle AFB.

The Downtown Merced site is located at the city center and the transit hub of Merced, has good access to SR-99, and would have higher connectivity than the Castle (AFB) site. However, the Downtown Merced option would have higher construction issues, due to the need for four tracks needed through downtown Merced to accommodate express services.

Merced to Fresno

Preferred Alignment:

- Burlington Northern Santa Fe (BNSF)

Analysis:

The Authority staff recommends identification of the BNSF alignment as the preferred option for HST service between Merced and Fresno (see Figure 6.3-3A). The BNSF alignment avoids most of the urban areas between Merced and Fresno and would have substantially less constructability issues, would have fewer potential noise and property impacts, and is estimated to cost about \$400 million less than the UPRR alignment. USEPA has expressed concern over potential impacts on new corridor segments needed to connect the UPRR to the BNSF therefore it is recommended that the BNSF alignment, through Merced, be considered at the project-specific level because of its potential to reduce land severance impacts.

Potential environmental impacts throughout this segment could be avoided and minimized to the extent the HST system could share the existing freight rail right-of-way. The BNSF alignment option would include new alignment transitions just south of Merced and just north of Fresno and utilizes the UPRR alignment through Fresno and Merced. If a decision were made to proceed with the HST system, the Authority staff would seek agreements to utilize the existing rail right-of-way to the greatest extent feasible.

Preferred Station Location:

- Fresno: Downtown Fresno

Analysis:

The Authority staff recommends the Downtown Fresno option as the preferred HST station option to serve Fresno County, and the surrounding areas. The downtown Fresno station site has high connectivity and accessibility, with good freeway access and good connections to bus transit. This option is the preferred HST station site of the City of Fresno, Fresno County, and Fresno COG.

The Authority staff recommends identification of the direct option through Fresno, which does not include an express loop outside of Fresno (see Figure 6.3-3B). This option would have high construction issues since four tracks would be needed through much of Fresno to accommodate express services, and a considerable amount of the alignment through Fresno would be on aerial structure. However, this option would have fewer potential environmental impacts (impacts to farmlands, biological resources, wetlands), and is estimated to be at least \$700 million less costly than the option with the express loop (since the express loop would include 22-26 additional miles of alignment construction [35-42 km]). Analysis of the Fresno loop line option suggests that the primary benefit of moving the high-speed mainline (express tracks) outside the urban area would be a 12-16% reduction in potential noise impacts.

Comments received from Fresno County and the Fresno COG support the location of all high-speed tracks through the City of Fresno along the UPRR alignment. The City of Fresno suggests the Authority continue to investigate the "loop track", west of Fresno, for the relocation of the BNSF alignment away from Downtown Fresno. The Authority has received comments from BIA of the San Joaquin Valley and Granville Homes suggesting pushing the express loop further west, due to planned development. Moving the loop further to the west would increase the potential farmland impacts and costs. Additionally, USEPA has expressed concern over the loop concept throughout the Central Valley, noting that the extra tracks and system requirements may more than double the acreage of potentially affected farmland, would increase noise and visual impacts, and would increase potential impacts to water and biological resources.

Fresno to Bakersfield

Preferred Alignment:

- Burlington Northern Santa Fe (BNSF)

Analysis:

The Authority staff recommends identification of the BNSF alignment as the preferred option for HST service between Fresno and Bakersfield (see Figure 6.3-4A). The BNSF avoids most of the urban areas between Fresno and Bakersfield and is recommended as the preferred alignment because it would have fewer constructability issues, would have fewer potential noise and property impacts, and is estimated to cost between \$590-800 million less the UPRR alignment options. In order to maintain high-speed service on the BNSF alignment, construction of a new HST alignment around Hanford would be needed.

Potential environmental impacts throughout this segment could be avoided and minimized if the HST system could share the existing freight rail right-of-way. If a decision is made to proceed with the proposed HST system, the Authority staff would seek agreements with BNSF to utilize the existing rail right-of-way to the greatest extent feasible.

Due to concern over the potential bisecting of the communities south of Fresno, the City and County of Fresno, Fresno COG, and the cities of Fowler, Selma, and Kingsburg are opposed to the UPRR alignment as proposed and suggest if the UPRR alignment is selected that a trench be considered to reduce the impacts to these smaller communities. The California Department of Parks and Recreation has stated a preference for the UPRR alignment between Fresno and Bakersfield. Parks and Recreation notes potential visual, noise and vibration impacts to the Colonel Allensworth State Historical Park, located south of Hanford along the BNSF alignment. The Authority staff recommends comprehensive study to avoid and/or minimize the potential impacts to these sensitive areas as part of project level environmental review. Considerable public and agency comments were received supporting the UPRR alignment with a Visalia Airport station stop, including comments from the Tulare County Association of Governments and the cities of Visalia and Tulare.

Preferred Station Locations:

- Tulare and Kings County: No HST Station

Analysis:

The Authority staff recommends that the existing Amtrak intercity rail service should link Kings County and Tulare County to the HST system and recommend that the preferred HST alternative have no station to directly serve Hanford (the Hanford site is the only station option for Tulare/Kings counties on the recommended BNSF alignment). The Hanford/Visalia station options would have the lowest ridership potential of all the potential stations investigated by the Authority. In 2020, a Hanford or Visalia station is forecast to have only between 140,000 and 160,000 annual total intercity boardings and alightings by 2020. In addition, as a result of not having the Hanford HST station would eliminate the alignment through Hanford, resulting in cost savings of about \$420 million plus less potential environmental impact since the HST alignment would avoid the Hanford urban area.

- Bakersfield: Truxtun (Downtown Bakersfield)

Analysis:

The Authority staff recommends identifying the Truxtun station option in downtown Bakersfield as the preferred HST station option to serve Kern County (see Figure 6.3-4B). The Truxtun HST station would have the highest connectivity and would connect to the new Bakersfield Amtrak Station and has good

access to SR-99. The Truxtun site is in the city center of Bakersfield and is within walking distance the convention center and City Hall. The City of Bakersfield, Kern County, Kern County COG, and the Kern County Transportation Foundation for HST service for Kern County prefer this station option.

Bay Area - Merced

The region from the Bay Area to Merced was divided into three segments: 1) San Francisco to San Jose; 2) Oakland to San Jose; and 3) San Jose to Merced. The San Jose to Merced segment was discussed in Part 1 of the Staff Recommendations.

The Authority staff, in consultation with the FRA, has identified a broad corridor between the Bay Area and the Central Valley containing a number of feasible route options within which further study will permit the identification of a single preferred alignment alternative. This corridor is generally bounded by (and includes) the Pacheco Pass (SR-152) to the south, the Altamont Pass (I-580) to the north, the BNSF Corridor to the east, and the Caltrain Corridor to the west, but would not include alignment options through Henry Coe State Park and station options at Los Banos.² The Authority staff recommends that future studies focus on the identification of a preferred alignment between the Central Valley and the San Francisco Bay area.

Future studies should include consideration of: (1) how and where the HST alignment from the Bay Area would connect with the HST alignment in the Central Valley; (2) how and where the HST alignment would enter the Bay area and would connect to Bay Area termini; (3) the location of stations within these segments.

The following recommendations for the San Francisco to San Jose and Oakland to San Jose segments are based upon current information. These recommendations are subject to change based upon the information provided in future studies.

San Francisco to San Jose

The Authority staff, in consultation with the FRA, has identified a broad corridor between the Central Valley and the Bay Area containing a number of feasible route options within which further study will permit the identification of a single preferred alignment alternative. Future studies would consider how much of the Caltrain alignment between San Francisco and San Jose would be included as part of the HST system.³

Preferred Alignment:

- Caltrain Corridor (Shared Use)

Analysis:

The Draft Program EIR/EIS analyzes one alignment option between San Francisco and San Jose along the San Francisco Peninsula that would utilize the Caltrain rail right-of-way, and share tracks with express Caltrain commuter rail services (see Figure 6.2-1). The Authority staff recommends identifying the Caltrain Corridor (Shared Use) as the preferred alignment option for direct service to San Francisco and San Francisco International Airport (SFO).

² Highway route numbers are provided only as a convenient reference for the reader, not as a limitation on the corridor to be considered.

³ In the Authority's previous investigations a potential Altamont Pass alignment option included a new Bay crossing near the Dumbarton Bridge. With this previous concept involving the Altamont Pass the proposed HST service would use only that portion of the Caltrain alignment between Redwood City and San Francisco on the San Francisco Peninsula.

The alignment between San Francisco and San Jose is assumed to have 4-tracks, with the two middle tracks being shared by Caltrain and HST. HST trains could operate at maximum speeds of 100-125 mph along the Peninsula providing 30-minute express travel times between San Francisco and San Jose. Environmental impacts would be minimized since this alignment utilizes the existing Caltrain right-of-way. This alignment would increase connectivity and accessibility to San Francisco, the Peninsula, and SFO, the hub international airport for northern California. The HST system would provide a safer, more reliable, energy efficient intercity mode along the San Francisco Peninsula while improving the safety, reliability, and performance of the regional commuter service because of the fully grade separated tracks with fencing to prevent intrusion, additional tracks, and a state-of-the-art signaling and communications system. The HST alignment would greatly increase the capacity for intercity and commuter travel and reduce automobile traffic.

Many comments in favor of the proposed HST on the San Francisco Peninsula were received from agencies and the public, including MTC, the City of San Francisco, Caltrain JPB, Samtrans, BART, the Transbay Terminal JPB, the City of Los Altos Hills, the City of Milpitas, the City of Santa Clara, the County of Santa Clara, the City of Morgan Hill and the San Francisco Chamber of Commerce. There was also opposition to improvements on the Caltrain corridor raised by some members of the public. The City of Menlo Park supported investigating options to avoid the SF Peninsula area by integrating HST with existing systems, and the Town of Atherton supports options that would avoid HST service through the Town of Atherton as well as investigating trench concepts through the Town of Atherton at the project-specific level.

Preferred Station Locations:

- Downtown San Francisco Terminus: Transbay Terminal

Analysis:

The Authority staff recommends identifying the Transbay Terminal site as the preferred station option for the San Francisco Terminal. The Transbay Terminal would offer greater connectivity to San Francisco and the Bay Area than the 4th and King site (about a mile from the financial district) because of its location in the heart of downtown San Francisco and since it would serve as the regional transit hub for San Francisco. The Transbay Terminal is located in the financial district where many potential HST passengers could walk to the station. The Transbay Terminal is also expected to emerge as the transit hub for all major services to downtown San Francisco, with the advantage of direct connections to BART (1 block from the terminus), Muni, and regional bus transit (Samtrans, AC Transit, and Golden Gate District). Moreover, the Transbay Terminal is compatible with existing and planned development and is the focal point of the Transbay redevelopment plan that includes extensive high density residential, office, and commercial/retail development.

The rail component of the Transbay Terminal is estimated to cost about \$500 million more than the 4th and King option, however because the rail component would be shared with Caltrain services, the Transbay Joint Powers Authority funding plan assigns only a portion of the rail related Transbay Terminal costs to the HST system. The rail facilities planned for the Transbay Terminal are for 6 tracks and 3 platforms. The Authority's operational analysis indicated that to serve all of the HST trains proposed in the Authority's Business Plan, four tracks and two island platforms would have to be dedicated to HST service. Subsequent cooperative operations planning analysis of the Transbay terminal rail capacity available for HST and Caltrain commuter service would be needed to determine the most efficient mix and scheduling of services.

Public and agency comments have largely favored the Transbay Terminal site. The City of San Francisco, the Transbay Terminal JPB, Samtrans, the Caltrain JPB, the San Francisco Chamber of Commerce, and AC Transit all submitted comments in favor of the Transbay Terminal site.

- San Francisco Peninsula Airport Connector Station: Millbrae (SFO)

Analysis:

Two airport connector station options were considered for the San Francisco peninsula in the Draft Program EIR/EIS, Millbrae for San Francisco International Airport (SFO) and Santa Clara for San Jose International Airport. SFO serves as the “hub” airport for international travel in Northern California and is located about 12 miles south of downtown San Francisco. The conceptual design is to link to SFO at the Millbrae Caltrain/BART station location which is adjacent to SFO (but not directly at the airport). This multi-modal station would link to the airport by the existing BART connection and could possibly be reached in the future by the airport people mover system. The Millbrae (SFO) HST station supports the objectives of the HST project by providing an interface with the northern California hub airport for national and international flights. The Authority staff recommends the identification of Millbrae (SFO) as the HST airport connector station on the San Francisco peninsula.

A potential link to San Jose International Airport would be at Santa Clara less than 3 miles north of the potential downtown San Jose station. Because the downtown San Jose (Diridon) station site would provide sufficient connectivity to San Jose airport for the foreseeable future the Authority staff recommends that the preferred HST alternative have no HST station at Santa Clara.

- Mid-Peninsula Station: continue study of potential sites at Palo Alto and Redwood City

Analysis:

The Authority staff, in consultation with the FRA, has identified a broad corridor between the Central Valley and the Bay Area within which further study will permit the identification of a preferred alignment alternative. Future studies would consider how much of the Caltrain alignment between San Francisco and San Jose would be included as part of the HST system and whether a Mid-Peninsula station site should be recommended.⁴

Oakland to San Jose

The provision of HST service to Oakland would increase connectivity and accessibility to the East Bay, including Oakland International Airport. The HST system would provide a safer, more reliable, energy efficient intercity mode directly to the East Bay while improving the safety, reliability and performance of the existing Capitol intercity service through grade separation improvements between Oakland and Union City. The HST alignment would greatly increase the capacity for intercity travel in the East Bay and reduce highway congestion. Direct service to Oakland and the East Bay is supported by MTC, the City of Oakland, BART, and the Alameda County Congestion Management Agency.

The Authority staff, in consultation with the FRA, has identified a broad corridor between the Central Valley and the Bay Area containing a number of feasible route options within which further study will

⁴ In the Authority’s previous investigations a potential Altamont Pass alignment option included a new Bay crossing near the Dumbarton Bridge. With this previous concept involving the Altamont Pass the proposed HST service would use only that portion of the Caltrain alignment between Redwood City and San Francisco on the San Francisco Peninsula.

permit the identification of a single preferred alignment alternative. These recommendations for the Oakland to San Jose alignment and stations are based upon current information and are subject to change based upon the information provided in other future studies.

Preferred Alignment:

- Hayward Line to I-880

Analysis:

Two alignment options were considered between San Jose and Oakland, the Hayward Line/I-880 and the Hayward Branch/Niles/Mulford Line. Both options would use the Hayward Line freight railroad right-of-way (also used by the "Capitol" intercity Amtrak service) between Oakland and Union City. At Union City, the Hayward Line/I-880 option would diverge to the median of Interstate 880 (on an aerial structure) to bring the alignment to San Jose and a tunnel under a small lake in Fremont Central Park. This option is estimated to cost about \$140 million more than the Hayward Line/Niles/Mulford option (about 4% of the cost between Oakland and San Jose) but would have higher ridership potential and considerably less potential environmental impact. Authority staff recommends identifying the Hayward Line/I-880 as the preferred alignment option between Oakland and San Jose (see Figure 6.2-2).

The Hayward Line/Niles/Mulford option would require tight curves that would greatly limit operational speeds between Union City and Newark – with express travel times at least 6 minutes longer than the Hayward Line/I-880 option. This alignment also goes through the Don Edwards National Wildlife Refuge, which would result in considerably higher potential for environmental impacts (hydrology and water resources, biology and wetlands, visual impacts, and Section 4(f) and 6(f) parkland impacts) than the Hayward Line/I-880 alignment option.

MTC and the City of Newark support the Hayward Line/I-880 alignment option. Caltrans District 4 commented that there would be significant construction stage impacts if the alignment encroaches onto the I-880 median between Fremont and San Jose, and there is a need for a detailed analysis of potential construction impacts during project level environmental review.

Preferred Station Locations:

- Downtown Oakland Terminus: continue investigation of both West Oakland and 12th Street/City Center sites

Analysis:

The West Oakland station option and the 12th Street/City Center station options would both provide good connectivity with BART and would have similar potential for environmental issues. Although the 12th Street/City Center option is in the heart of downtown Oakland, it would have more construction and right-of-way issues. The MTC favors the West Oakland option, but supports continuing to investigate both station sites, while the City of Oakland believes both should be further investigated. The Authority staff recommends the continued investigation in future tiered environmental reviews of both the West Oakland and the 12th Street/City Center sites as potential locations for a terminus station in Oakland because this program process has not provided enough information to differentiate between these two remaining station options.

- Oakland Airport Connector Station: Coliseum BART Station

Analysis:

A multi-modal station (BART/Capitol/HST) at the Coliseum BART station, which is located about two miles from the Oakland Airport passenger facilities, could connect the proposed HST system to Oakland Airport. This potential station would be about 7-miles south of downtown Oakland. The Authority staff recommends identifying the Coliseum BART HST station as preferred in support of the HST project objective to connect to major airports.

- Southern Alameda County Station: Union City

Analysis:

The Authority staff recommends the Union City station location as the preferred HST station to serve Southern Alameda County. The multi-modal Union City station site offers a high level of connectivity with connections to BART, the Capitol Corridor, and AC Transit and could connect to the Altamont Commuter Express service. It would have low potential for environmental impacts, whereas the Auto Mall Parkway site is adjacent to the Don Edwards Wildlife Refuge. The Union City station site is supported by the City of Union City.

- Downtown San Jose Terminus: Diridon Station

Analysis:

Diridon Station is the transit hub for downtown San Jose and the Southern Bay Area, serving Caltrain, ACE Commuter Rail, the Capitol Corridor, Amtrak long distance services, VTA buses and light rail, and a possible future link to BART (from Fremont). Diridon station is a multi-modal hub that maximizes connectivity to downtown San Jose and the southern Bay Area, and would have high ridership potential. The Authority staff recommends the identifying the Diridon Station as the preferred HST station option for San Jose and the southern Bay Area. Diridon Station is the favored site of the City of San Jose and the Valley Transportation Authority (VTA).

Los Angeles – Inland Empire – San Diego

The region from Los Angeles to San Diego via the Inland Empire was divided into three segments: 1) Los Angeles to March ARB; 2) March ARB to Mira Mesa; and 3) Mira Mesa to San Diego.

Los Angeles to March ARB

Preferred Alignment:

- UPRR Riverside/UPRR Colton Line

Between LA Union Station and March ARB, each of the alignment options considered utilize existing freight railroad alignments and the HST would be either in or immediately adjacent to the freight railroad right-of-way. The Authority staff recommends identifying the UPRR Riverside/Colton alignment option as preferred between Los Angeles and March ARB (see Figure 6.5-1).

Comparing the two alignments between Los Angeles and Pomona, although the UPRR Riverside/Colton option is a more heavily used freight corridor (with more freight related constraints and future potential for freight expansion) than the UPRR Colton Line, the UPRR Riverside/Colton option would provide a much better connection to Los Angeles Union Station (LAUS) and to Northern California (since it connects to Union Station from the south). The UPRR Colton line enters LAUS from the north, and would likely require a direction reversal using LAUS as a stub-end station for trains traveling from the Inland Empire to northern California thereby could increase travel times between these markets by at least 10 minutes with the recommended HST station at LAUS. Between LAUS and March ARB, the alignment options considered would have similar potential for environmental impacts. The Riverside/Colton option would have the least potential costs, about \$1.2 billion less than the Colton Line option.

For the segment between Ontario and March ARB, the UPRR Colton Line (considered part of both the UPRR Riverside/Colton and UPRR Colton alignment options) would provide considerably higher speeds and faster travel times (estimated at 6 minutes less between LA and San Diego) than the option that would directly serve San Bernardino. A direct link to San Bernardino is estimated to cost \$700 million more (than either the Riverside/Colton option or the Colton option) and would not avoid or substantially reduce potential environmental impacts.

The San Bernardino Associated Governments (SANBAG) supports further investigation of both the direct link to San Bernardino and the freight alignment through Colton. The California Regional Water Quality Control Board supports the selection of the San Bernardino loop alignment. Southern California Regional Rail Authority (SCRRA) is opposed to having a stub-end station at LAUS, and commented that a potential revision of track configuration could remove existing passenger services from the Riverside Line (LA – Pomona) to open up capacity for freight operations.

Preferred Station Locations:

- East San Gabriel Valley Station Location: City of Industry

Analysis:

The Authority staff recommends the City of Industry site be selected as the preferred HST station site to serve East San Gabriel Valley (East Los Angeles County). The City of Industry site would have a wide range of multimodal connections to local and regional bus services, and Metrolink commuter rail service,

and have good access to the freeway network. The City of Industry site would provide a central location between potential HST stations at LAUS and Ontario Airport. The City of Industry station would be constructed at grade and minimizes both cost and construction issues.

- Ontario Airport Connector Station

Analysis:

The Authority staff recommends identifying Ontario Airport as a preferred HST station option. The UPRR Colton Line creates the northern boundary of the airport and is about a quarter of a mile from the air passenger terminal. The Ontario Airport HST station would support the objectives of the HST project by providing an interface with one of the larger airports in southern California. This station would also provide direct HST service to San Bernardino County.

- Riverside County/East San Bernardino County: University of California Riverside

Analysis:

The Authority staff recommends identifying the UC Riverside option as the preferred HST station to serve the City of Riverside and Riverside County. The UC Riverside station site would provide the best access to Riverside. Should the HST project move forward, project level environmental review will involve continued work with the City of Riverside and the region to further define the HST alignment and the potential sites for the Riverside station option.

March ARB to Mira Mesa

Preferred Alignment:

- I-215/I-15

Analysis:

The Authority staff recommends identifying the I-215/I-15 alignment option as preferred between March ARB and Mira Mesa. The HST alignment option between March ARB and Mira Mesa would generally follow the Interstate 215 and then the Interstate 15 corridor to Mira Mesa (see Figure 6.5-2). This is the only existing major transportation corridor directly connecting the Inland Empire to San Diego. SANDAG, NCTD, MTDB, Caltrans District 11, Murrieta, Escondido and the City of San Diego all support direct HST service to San Diego via the Inland Empire (I-15 Corridor).

The EPA is concerned with potential impacts to the Santa Margarita Ecological Reserve and the Santa Margarita River. In addition, the mountainous terrain just south of Temecula is considered to contain important tribal cultural areas and concerns have been raised regarding potential impacts to this area and the Exeava Temeku village (near the I-15/I-79 interchange). Ways of avoiding and minimizing potential impacts to these resources would be investigated during project level environmental review.

Preferred Station Locations:

- Temecula Valley Station: Murrieta

Analysis:

The Authority staff recommends the Murrieta station site as the preferred HST option to serve the Temecula and Murrieta area of Riverside County. The Murrieta Station site would have convenient access to I-15 and I-215. The City of Murrieta submitted comments in support of an HST station in Murrieta.

- Escondido Station Area: Escondido I-15

Analysis:

The Escondido Transit Center option would have better connectivity (within 1/8 of a mile of the transit center, and could link to Bus Rapid Transit and the Sprinter light rail transit service) and is the strongly preferred HST station option of the City of Escondido, SANDAG and NCTD. However, serving the Escondido Transit Center would require leaving the I-15 alignment and tunneling under the Centre City Parkway which would be more difficult and costly (estimated at over \$900 million more) to construct than the I-15 station option and the Escondido Transit Center would not avoid or substantially reduce potential environmental impacts. The I-15 station option is considered to be moderately compatible with the surrounding land uses, and would have few environmental concerns.

The Authority staff recommends identifying the I-15 station option as the preferred station option to serve Escondido, the I-15 corridor and North/East San Diego County since it is considerably less costly to construct and would be easier to construct than tunneling under Escondido. However, ultimate locations and the configurations of stations cannot be determined until the more detailed project-level environmental processes. Should the HST project move forward, project level environmental review will involve continued work with the City of Escondido and the region to further define the HST alignment and potential sites for the I-15 station.

Mira Mesa to San Diego

Preferred Alignment:

- Continue to investigate both the Carroll Canyon and Miramar Road alignment options.

Analysis:

The Authority staff recommends continuing to investigate both the Carroll Canyon and Miramar Road alignment options between Mira Mesa and San Diego (see Figure 6.5-3). These options would enable the HST system to directly serve downtown San Diego, whereas the I-15 to Qualcomm option would terminate about 8-miles from the city center at the Qualcomm Stadium (20 minutes by light rail). SANDAG, NCTD, MTDB, Caltrans District 11, and the City of San Diego all support direct HST service to downtown San Diego via the Inland Empire (I-215/I-15 Corridor).

The Qualcomm Stadium concept would be about \$140 million less to construct than the Carroll Canyon option, and \$70 million less than the Miramar Road option, but would not provide the same level of connectivity to downtown San Diego as the other alignment options. Although the I-15 option terminating at Qualcomm Stadium was forecast to have higher intercity ridership (350,000 more for 2020), the options that would directly serve Downtown San Diego would provide better connections to the regional transit system and airport.

The Carroll Canyon alignment option would have similar potential environmental impacts as the Miramar Road alignment option. However, the Carroll Canyon option would avoid and minimize potential impacts

to Miramar Naval Air Station as compared to either the Miramar Road or I-15 alignment option. As compared to the I-15 option, the Carroll Canyon option would have less potential impacts to streams and parklands, and less potential for growth-induced impacts, but more potential visual, cultural, and floodplains impacts.

The United States Marine Corps has raised concern regarding the Miramar Road option which is directly adjacent to the Miramar housing complex and "sensitive habitats" and has noted that any efforts related to the proposed HST system that would limit or impact on the Marine Corps ability to perform its mission would be opposed. The City of San Diego commented that building the alignment below grade should be considered from Old Town to Downtown San Diego. SANDAG commented that the I-15 corridor would be attractive to long-distance commuters and has requested that the Authority consider a future partnership to look at details for an intercity/commuter service in the I-15 Corridor. However, the USEPA recommends avoiding placement of a HST route in canyons due to the "significant" permitting challenges such alternatives may face as a result of potentially large amounts of cut and fill, and increased potential for erosion, sedimentation, and other stream impacts.

Preferred Station Locations:

- Mid-San Diego County Station: University City

Analysis:

The Authority staff recommends the University City station site as the preferred HST option to serve the University City/University Town Centre/La Jolla area. A station to serve this high density area of San Diego County is supported by the City of San Diego.

SANDAG's comments support having a HST station to serve the North City (San Diego) area. SANDAG wants to continue to work with the Authority to determine the appropriate site for a North City station.

- San Diego Station: Downtown San Diego Santa Fe Depot

Analysis:

The Authority staff recommends identifying the Downtown San Diego Santa Fe Depot station option as the preferred station option to serve San Diego. The Downtown San Diego Santa Fe Depot is the transit "hub" station for downtown San Diego and locating the HST station here would result in the highest level of connectivity. This station option would be located in the city center where many potential HST passengers could walk to their destination and would offer good connectivity with San Diego International Airport, which is about two miles from this site. The Downtown San Diego Santa Fe Depot is also the terminus for the Coaster commuter rail service and the Amtrak Surfliner service, a major San Diego LRT station, and a bus transit hub.

The Downtown San Diego station option is preferred by SANDAG, NCTD, MTDB and the City of San Diego. In addition, the San Diego Regional Airport Authority commented that the HSR station option at San Diego Airport may hamper their ability to improve airport facilities and could cause considerable traffic and parking problems.